





**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

## In re Patent Application of Dahl et al.

Application No.: 10/622,130

Filed: July 16, 2003

For: HETERODIAMONDOIDS

Group Art Unit: 1764

Examiner:

Confirmation No.: 2442

## **SECOND INFORMATION DISCLOSURE STATEMENT**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

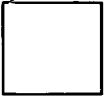
Sir:

In accordance with the duty of disclosure as set forth in 37 C.F.R. § 1.56, the accompanying information is being submitted in accordance with 37 C.F.R. §§ 1.97 and 1.98.

Pursuant to 37 C.F.R. § 1.98, a copy of each of the documents cited is enclosed. However, copies of the listed U.S. patents and U.S. patent application publications are not enclosed since it is no longer required according to the July 11, 2003 waiver of the requirement for copies of cited U.S. patents and U.S. patent application publications in national patent applications filed after June 30, 2003 and international applications entering the national stage under 35 U.S.C. § 371 after June 30, 2003.

The documents are being submitted within three (3) months of the filing or entry of the national stage of this application or before the first Office Action on the merits, whichever is later. Since these documents are being filed within the time period set forth in 37 C.F.R. § 1.97(b), no fee or statement is required.

The Examiner's attention is directed to copending application number 10/046,486, naming Dahl, et al., as inventor(s) and filed on January 16, 2002, and the documents cited therein, a copy of which is enclosed.

 In accordance with MPEP § 609 III C(2) (August 2001, page 600-131), the Office is requested to return a copy of this Information Disclosure Statement with the Examiner's initials adjacent to this paragraph indicating that this copending application has been considered. By citation to the copending application, confidentiality is not waived and the Office is requested to maintain the confidentiality of the copending application under 35 U.S.C. § 122.

This Information Disclosure Statement contains information which is not in the English language but was cited in a search report or other action by a foreign patent office in a counterpart foreign application. In accordance with MPEP § 609 III A(3), an English language version of the search report or action which indicates the degree of relevance found by the foreign office is being submitted herewith.

To assist the Examiner, the documents are listed on the attached form PTO-1449. It is respectfully requested that an Examiner initialed copy of this form be returned to the undersigned.

Respectfully submitted,

BURNS, DOANE, SWECKER & MATHIS, L.L.P.

Date July 2, 2004

By: Stephen F. Powell  
Stephen F. Powell  
Registration No. 43,014

P.O. Box 1404  
Alexandria, Virginia 22313-1404  
(703) 836-6620

Substitute for forms 1449A/PTO & 1449B/PTO  <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>	ATTORNEY'S DKT NO. 005950-836	APPLICATION NO. 10/622,130
	APPLICANT Liu et al.	
	FILING DATE July 16, 2003	GROUP 1764

U.S. PATENT DOCUMENTS				
Examiner Initials	Document Number	Kind Code (if known)	Name of Patentee or Applicant of Cited Document	Issue/Publication Date (MM-DD-YYYY)
	6,340,393	B1	Yoshida	01-22-2002
	6,274,837	B1	Windischmann et al.	08-14-2001
	6,235,851		Ishii, et al.	05-22-2001
	6,162,412		Fujimori et al.	12-19-2000
	5,792,256		Kucherov et al.	08-11-1998
	5,656,828		Zachai et al.	08-12-1997
	5,632,812		Hirabayashi	05-27-1997
	5,478,650		Davanloo et al.	12-26-1995
	5,414,189		Chen, et al.	05-09-1995
	5,382,684		Moini et al.	01-17-1995
	5,382,809		Nishibayashi et al.	01-17-1995
	5,017,734		Baum et al.	05-21-1991
	3,832,332		Thompson	08-27-1974
	3,457,318		Capaldi et al.	07-22-1969

FOREIGN PATENT DOCUMENTS					
Examiner Initials	Document Number	Kind Code (if known)	Country	Date of Publication (MM-DD-YYYY)	Translation Yes No
	2,545,292		DE	04-1979	
	US02/00505		WO	01-17-2002	

NON PATENT LITERATURE DOCUMENTS	
Examiner Initials	Include name of author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
	U.S. Patent Application Serial No. 10/046,486 filed January 16, 2002.
	Balaban et al., "Systematic Classification and Nomenclature of Diamond Hydrocarbons -I, <i>Tetrahedron</i> 34:3599-3606 (1978).
	Baugman, G.I., "Dibromination of Adamantane", (1964).
	Becker et al, "A Short Synthese of 1-azaadamantan-4-one and the 4r and 4s Isomers of 4-Amino-1-azaadamantane", <i>Synthesis</i> 11:1080-1082 (1992).
	Bingham, R.C. et al., Chapter 18 of "Chemistry of Adamantanes", <i>Springer-Verlag</i> (1971).
	Bishop, R., et al., "Detection of Non-Conjugative Interactions in Rigid Cyclic Molecules by Using Carbon-13 N.M.R. Shift Values", <i>Aust. J. Chem.</i> 40:249-255 (1987).
	Black, R.M. et al., "Adamantane Chemistry. Part 3. Abnormal Hypiodite Reactions of 2-Substituted Adamantan-2-ols; Synthetic Routes to 4-Oxahomo- and 2-Oxa-adamantanes, and 7-Substituted-bicyclo[3.3.1]nona-3-ols", <i>J. Chem. Soc. Perkins Trans.</i> 1410-418 (1980).
	Blaney et al, "Chemistry of Diamantane, Part II. Synthesis of 3,5-disubstituted Derivatives", <i>Synthetic Communications</i> 3(6):435-439 (1973).
	Boudjouk et al, "Synthesis and Reactivity of 1-Silaadamantyl Systems", <i>Journal of Organometallic Chemistry</i> 2:336-343 (1983).
	Boudjouk et al, "The Reaction of Magnesium with cis-1,3,5-Tris(bromomethyl)cyclohexane. Evidence For a Soluble Tri-grignard", <i>Journal of Organometallic Chemistry</i> 281:C21-C23 (1985).

Substitute for forms 1449A/PTO & 1449B/PTO	ATTORNEY'S DKT NO. 005950-836	APPLICATION NO. 10/622,130
	APPLICANT Liu et al.	
	FILING DATE July 16, 2003	GROUP 1764
	<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>	

NON PATENT LITERATURE DOCUMENTS	
Examiner Initials	Include name of author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
	Bubnov et al, "A Novel Method of Synthesis of 1-azaadamantane from 1-boraadamantane", <i>Journal of Organometallic Chemistry</i> <b>412</b> :1-8 (1991).
	Cao, G.Z., "Nitrogen and Phosphorus Doping in CVD Diamond", <i>Diamond</i> , edited by M.H. Nazare and A.J. Neves, INSPEC pp. 345-347 (2001).
	Chakrabarti et al., "Chemistry of Adamantane. Part II. Synthesis of 1-Adamantyloxyalkylamines", <i>Tetrahedron Letters</i> <b>60</b> :6249-6252 (1968).
	"Computation Concepts" <i>Chem3D Molecular Modeling and Analysis User's Guide</i> , Chapter 9, pages 123-144.
	Courtney, T., Johnston, D.E. McKervey, M.A. and Rooney, J.J., "The Chemistry of Diamantanes. Part 1. synthesis and Some Functionalisation Reactions", <i>J. Chem. Soc. Perkin I</i> 2691-2696 (1972).
	Eguchi et al, "A Novel Route to the 2-Aza-adamantyl System via Photochemical Ring Contraction of Epoxy 4-Azahomoadamantanes", <i>Journal of Organometallic Chemistry, Commun.</i> , 1147-1148 (1984).
	Fernandez, M.J., et al., "NMR Study of 1-Azatricyclo[3.3.1 <sup>3-7</sup> ]decane Derivatives", <i>J. Heterocyclic Chem.</i> <b>26</b> :307-312 (1989).
	Fernandez, M.J., et al., "Synthesis, Structural and Conformational Study of 4- $\alpha$ -(or $\beta$ )-p-Chlorobenzoyloxy-1-azaadamantane Hydrochloride", <i>J. Heterocyclic Chem.</i> <b>26</b> :349-353 (1989).
	Fleming, I., et al., "A New Oxindole Synthesis", <i>J. Chem. Soc. Perkin Trans. 1</i> :617-626 (1991).
	Fort, Jr., et al., "Stereochemistry of Hydride Reductions of 4,8-Dihalo-2-thiaadamantanes and Related Thiabicyclo[3.3.1]nonanes", <i>J. Org. Chem.</i> <b>52</b> :2396-2399 (1987).
	Fox, M.A., et al., "Transmission of Electronic Effects by Icosahedral Carboranes; Skeletal Carbon-13 Chemical Shifts and Ultraviolet-Visible Spectra of Substituted aryl-p-carboranes (1,12-dicarba-closo-dodecaboranes)", <i>J. Chem. Soc., Dalton Trans.</i> 401-411 (1998).
	Gagneux et al, "1-Substituted 2-Heteroadamantanes", <i>Tetrahedron Letters</i> <b>17</b> : 1365-1368 (1969).
	Gerzon, et al., "The Adamantyl Group in Medicinal Agents, 1. Hypoglycemic N-Arylsulfonyl-N-adamantylureas", <i>Journal of Medicinal Chemistry</i> <b>6</b> (6):760-763 (1963).
	Hass, et al., Adamantyoxycarbonyl, a New Blocking Group. Preparation of 1-Adamantyl Chloroformate", <i>Journal of the American Chemical Society</i> <b>88</b> (9):1988-1992 (1966).
	Hahn, J.M. et al., "Strongly Enhanced Stereoselectivity in the Reduction of 5-Substituted Adamantanones by Substitution of C <sub>5</sub> by Positive Nitrogen", <i>J. Am. Chem. Soc.</i> <b>114</b> :1916-1917 (1992).
	Hawley, "Condensed Chemical Dictionary", 14th ed., John Wiley & Sons, Inc., 2001.
	Henkel et al, "Neighboring Group Effects in the $\beta$ -halo Amines. Synthesis and Solvolytic Reactivity of the anti-4-Substituted 2-Azaadamantyl System", <i>Journal of Organometallic Chemistry</i> <b>46</b> :4953-4959 (1981).
	Jawdosiuk, M., et al., "Photolysis and Thermolysis of 3-Azidonoradamantane. "Anti-Bredt" Imines, 2-aza-adamant-1-ene, and 4-Azaprotadamant-3-ene", <i>J. Chem. Soc. Perkin Trans 1</i> :2583-2585 (1984).
	Johnston, C., et al., "Boron Doping and Characterisation of Diamond", <i>Diamond</i> , edited by M.H. Nazare and A.J. Neves, INSPEC pp. 337-344 (2001).
	Kalish, R., et al., "Doping of Diamond Using Ion Implantation", <i>Diamond</i> , edited by M.H. Nazare and A.J. Neves, INSPEC pp 321-330 (2001).
	Krasutsky, P.A., et al., "A New One-Step Method for Oxaadamantane Synthesis", <i>Tetrahedron Letters</i> <b>37</b> (32):5673-5674 (1996).
	Krasutsky, P.A., et al., "Observation of a Stable Carbocation in a Consecutive Criegee Rearrangement with Trifluoroacetic Acid", <i>J. Org. Chem.</i> <b>65</b> :3926-3933 (2000).

Substitute for forms 1449A/PTO & 1449B/PTO	ATTORNEY'S DKT NO.	APPLICATION NO.
	005950-836	10/622,130
	APPLICANT	
	Liu et al.	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT	FILING DATE	GROUP
	July 16, 2003	1764

NON PATENT LITERATURE DOCUMENTS	
Examiner Initials	Include name of author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
	Krishnamurthy et al, "Heteroadamantanes. 2. Synthesis of 3-Heterodiamantanes", <i>Journal of Organometallic Chemistry</i> , <b>46(7)</b> :1389-1390 (1981).
	Kurtsiefer, C., et al., "Stable Solid-State Source of single Photons", <i>Physical Review Letters</i> <b>85(2)</b> :290-293 (2000).
	Lansbury, et al., "Some Reactions of $\alpha$ -Metalated Ethers", <i>The Journal of Organic Chemistry</i> <b>27(6)</b> :1933-1939 (1962).
	Liaw, D.J, et al., "Synthesis and Characterization of New Polyamides and Polyimides Prepared from 2,2-bis[4-(4-aminophenoxy)phenyl]adamantane", <i>Macromol. Chem. Phys.</i> <b>200(6)</b> :1326-1332 (1999).
	Lin, et al., "Natural Occurrence of Tetramantane (C <sub>22</sub> H <sub>28</sub> ), Pentamantane (C <sub>26</sub> H <sub>32</sub> ) and Hexamantane (C <sub>30</sub> H <sub>36</sub> ) in a Deep Petroleum Reservoir", <i>Fuel</i> <b>74(10)</b> :1512-1521 (1995).
	Lippert, E., et al., "Darstellung und UV-Spektren einiger Fluorennon-Derivate", <i>Angew. Chem.</i> <b>71</b> :429-430 (1959).
	Makarova, et al., "Psychotropic Activity of Some Aminoketones Belonging to the Adamantane Group" <i>Pharmaceutical Chemistry Journal</i> <b>34</b> :6 (2000).
	Marchand, A.P., "Polycyclic Cage Compounds: Reagents, Substrates, and Materials for the 21 <sup>st</sup> Century", <i>Aldrichimica Acta</i> <b>28(4)</b> :95-104 (1995).
	Marshall et al., "N-Arylsulfonyl-N-alkylureas", <i>Journal of Organic Chemistry</i> <b>23</b> :927-929 (1958).
	Marshall et al., "Further studies on N-Arylsulfonyl-N-alkylureas", <i>Journal of Medicinal Chemistry</i> <b>6</b> :60-63 (1963).
	McKervey, et al., "Synthetic Approaches to Large Diamondoid Hydrocarbons", <i>Tetrahedron</i> <b>36</b> :9710992 (1980)
	Meeuwissen et al, "Synthesis of 1-Phosphaadamantane", <i>Tetrahedron Letters</i> , <b>39(24)</b> :4225-4228 (1983).
	Mikhailov, B.M., et al., "Organoboron Compounds", <i>J. Organometallic Chemistry</i> <b>250</b> :23-31 (1983).
	Moiseev, I.K., et al., "Reactions of Adamantanes in Electrophilic Media", <i>Russian Chem. Reviews</i> <b>68(12)</b> :1001-1020 (1999).
	Mukherjee, A.K., et al., "On the Stereochemistry of the Oxidation of 5-Phenyl-2-thiaadamantane", <i>J. Org. Chem.</i> <b>58</b> :7955-7957 (1993).
	Nordlander et al., "Solvolysis of 1-Adamantylcarbonyl and 3-Homoadamantyl Derivatives. Mechanism of the Neopentyl Cation Rearrangement", <i>Journal of the American Chemical Society</i> <b>88</b> :19 (1966).
	Okoroanyanwu, U. et al., "Alicyclic Polymers for 193 nm Resist Applications: Lithographic Evaluation", <i>Chem. Mater.</i> <b>10</b> :3329-3333 (1998).
	Park, S., et al., "endo-Fullerene and Doped Diamond Nanocrystallite-Based Models of Qubits for Solid-State Quantum Computers", <i>J. Nanoscience and Nanotechnology</i> <b>1(1)</b> :75-81 (2001).
	Pasini, D., et al. <i>Advanced Materials</i> <b>12</b> :347-351 (2000).
	Prins, J.F., "Large Dopants in Diamond", <i>Diamond</i> , edited by M.H. Nazare and A.J. Neves, INSPEC pp 331-336 (2001).
	Radziszewski, J.G., et al., "2-Azaadamant-1-ene and 4-Azaprotadamant-3-ene", <i>J. Am. Chem.</i> <b>106</b> :7996-7998 (1984).
	Ramdas, A.K., "A1.2 Modifications to <sup>12</sup> C-diamond by the <sup>13</sup> C-isotope: Raman, Brillouin and Infrared Spectroscopy of Phonons", <i>INSPEC, Properties, Growth and Applications of Diamondoids</i> (2001).
	Ramdas, A.K., "A1.3 Electronic Excitations in Isotopically Controlled Diamonds: Infrared and Raman Spectroscopy of Acceptor-Bound Holes", <i>INSPEC, Properties, Growth and Applications of Diamondoids</i> (2001).

Substitute for forms 1449A/PTO & 1449B/PTO  <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>	ATTORNEY'S DKT NO. 005950-836	APPLICATION NO. 10/622,130
	APPLICANT Liu et al.	
	FILING DATE July 16, 2003	GROUP 1764

NON PATENT LITERATURE DOCUMENTS	
Examiner Initials	Include name of author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
	Reinhardt, "Biadamantane and some of its Derivatives", <i>Journal of Organic Chemistry</i> 27:3258-3261 (1962).
	Risch, N., et al., "Triple (Grob) Fragmentation. Retro-Mannish Reactions of 1-Aza-Adamantane Derivatives", <i>Tetrahedron Letters</i> 32(35):4465-4468 (1991).
	Risch, N., et al., "Unusual Reorganization Reactions of 3-Azabicyclo[3.3.1]nonanes", <i>J. Am. Chem. Soc.</i> 113:9411-9412 (1991).
	Roberts, P.J., et al., "anti-Tetramantane, a Large Diamondoid Fragment", <i>Acta. Cryst.</i> B33:2335-2337 (1977).
	Sasaki, T. et al., "New Highly Strained Bridgehead Imines, 2-Azaadamant-1-ene and 4-Azaprotadamant-3-ene", <i>Tetrahedron Letters</i> 23(47):4969-4972 (1982).
	Sasaki, T., et al., "Synthesis and Acidolysis of 3-endo-Azidomethyl- and 3-endo-Azido-bicyclo[3.3.1]non-6-enes. A Novel Synthesis of 4-Azahomoadamant-4-enes", <i>J. Chem. Soc. Perkin Trans I</i> 2529-2534 (1983).
	Sasaki, T., et al., "Synthesis of Adamantane Derivatives. 42. Novel Synthesis of 5-Methylene-4-azahomoadamantane Derivatives from 2-Methyl-2-hydroxyadamantane and Their Carbon-13 Nuclear Magnetic Resonance Spectra", <i>J. Org. Chem.</i> 43(20):3810-3813 (1978).
	Sasaki, T., et al., "Photolytic Generation of Anti-Bredt Imines from 1-Azidobicyclo[2.2.2]octane, 1-Azidobicyclo[3.3.1]nonane, and 3-Azidonoradamantane", <i>J. Org. Chem.</i> 48(22):4067-4072 (1983).
	Sasaki et al., "Synthesis of Adamantane Derivatives. II. Preparation of Some Derivatives from Adamantylacetic Acid", <i>Bulletin of the Chemical Society of Japan</i> 41(1):238-240 (1968).
	Sasaki et al., "Substitution Reaction of 1-Bromoadamantane in Dimethyl Sulfoxide: Simple Synthesis of 1-Azidoadamantane", <i>Journal of the American Chemical Society</i> 92:24 (1970).
	Sasaki et al., "Synthesis of Adamantane Derivatives. 39. Synthesis and Acidolysis of 2-Azidoadamantanes. A Facile Route to 4-Azahomoadamant-4-enes", <i>Heterocycles</i> 7(1):315-320 (1977).
	Sasaki et al., "Synthesis of Adamantane Derivatives. 47. Photochemical Synthesis of 4-Azahomoadamant-4-enes and Further Studies on Their Reactivity in Some Cycloadditions", <i>Journal of Organometallic Chemistry</i> 44(21):3711-3712 (1979).
	Sasaki, T., et al., "Synthesis of Adamantane Derivatives. XII. The Schmidt Reaction of Adamantane-2-one", <i>J. Org. Chem.</i> 35(12):4109 (1970).
	Stetter, et al., "Zur Kenntnis der Adamantan-carbonsaure-(1)", <i>Über Verbindungen mit Urotropin-Struktur</i> , XVII, pp. 1161-1166 (1960).
	Stetter, et al., "Ein Beitrag zur Frage der Reaktivität von Brückenkopf-Carboniumionen", <i>Über Verbindungen mit Urotropin-Struktur XXVI</i> , <i>Chem. Ber.</i> 96:550-555 (1963).
	Stetter, et al., "Neue Möglichkeiten der Direktsubstitution am Adamantan", <i>Über Verbindungen mit Urotropin-Struktur, XLII</i> , <i>Chem. Ber.</i> 102(10):3357-3363 (1969).
	Stetter et al., "Über Adamantan-phosphonsaure-(1)-dichlorid", <i>Über Verbindungen mit Urotropin-Struktur XLIV</i> , <i>Chem. Ber.</i> 102(10):3364-3366 (1969).
	Stetter, et al., "Herstellung von Derivaten des 1-Phenyl-adamantans", <i>Über Verbindungen mit Urotropin-Struktur, XXXI</i> , <i>Chem. Ber.</i> 97(12):3488-3492 (1964).
	Stetter, H., et al., "Ringschlußreaktionen ausgehend von Bicyclo[3.3.1]nonandion-(3.7) Über Verbindungen mit Urotropin-Struktur, XXX 3480-3487 (1964).
	Suginome, H., et al., "The Replacement of the Carbonyl Group of Adamantanone by an Oxygen or sulfur Atom and the One-step Transformation of 2-Methyladamantan-2-ol into 2-Oxa-adamantane; An Efficient New Synthesis of 2-Oxa- and 2-Thiaadamantane", <i>Synthesis</i> 741-743 (1986).

Substitute for forms 1449A/PTO & 1449B/PTO  <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>	ATTORNEY'S DKT NO. 005950-836	APPLICATION NO. 10/622,130
	APPLICANT Liu et al.	
	FILING DATE July 16, 2003	GROUP 1764

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Include name of author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.		
	Suginome et al, "Photoinduced Transformations. 73. Transformations of Five-(and Six-) Membered Cyclic Alcohols into Five-(and Six-) Membered Cyclic Ethers-A New Method of a Two-Step Transformation of Hydroxy Steroids into Oxasteroids", <i>Journal of Organometallic Chemistry</i> 49:3753-3762 (1984).		
	Udding et al, "A Ring-opening Reaction of and Some Cyclisations to the Adamantane System. A Quasi-favorsky Reaction of a $\beta$ -bromoketone", <i>Tetrahedron Letters</i> 55:5719-5722 (1968).		
	Verhoeven, J.W., "From Close contact to Long-Range Intramolecular Electron Transfer", <i>Intramolecular Electron Transfer</i> , John Wiley and Sons, pp 603-644 (1999).		
	von H.U. Daeniker, "206. 1-Hydrazinoadamantan", <i>Helvetica Chimica Acta</i> 50:2008-2010 (1967).		
	Yang, X. et al., "The Synthesis and Structural Characterization fo Carborane Oligomers Connected by Carbon-Carbon and Carbon-Boron Bonds Between Icosahedra", <i>Inorganica Chimica Acta</i> 240:371-378 (1995).		
Examiner Signature		Date Considered	

EXAMINER: Initial if reference considered, whether or not citation is in conformance with M.P.E.P. § 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.